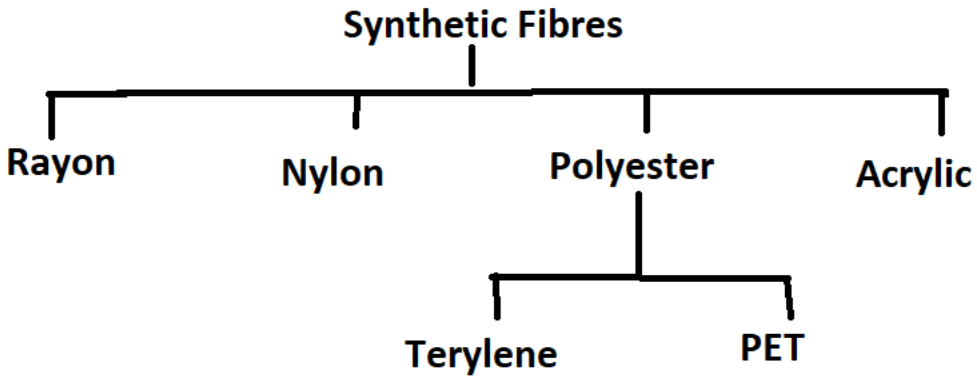
Introduction

- Fabrics are made from fibres obtained from natural or artificial sources. Fibres are also used for making a large variety of household articles.
- Natural fibres like cotton, wool, silk, etc., are obtained from plants or animals. The synthetic fibres, on the other hand, are made by human beings. That is why these are called synthetic or man-made fibres.

Polymer

- The term Polymer is derived from Greek word ***poly*** means many and ***mer*** means units or parts. A synthetic fibre is composed of small units which are basically chemical substances.
- Many such chemical substances combine together to form a large single unit called Polymer.
- Polymers occur in nature also. For example, cotton is a polymer of cellulose which is in turn is made up of a large number of glucose units.

Types of synthetic fibres



Rayon

- Rayon is obtained from a natural source, wood pulp, still it is a man-made fibre, having properties similar to silk.
- Rayon fibre chemically resembles cotton but has silk like shine. That is why, It is called artificial silk and is cheaper than silk.
- It is a good moisture absorbent and comfortable to wear.
- It can also be dyed in a wide variety of colours.

- Rayon is mixed with cotton to make bed sheets or mixed with wool to make carpets, sarees.

Nylon

- Nylon is the first fully synthesized fibre.
- In 1931, it was synthesized from coal, water and air.
- Nylon is elastic, strong and light. It is lustrous and easy to wash, so it is most popular for making clothes.
- Nylon fibres has high abrasion resistance, wrinkle resistance and is not attacked by moths and ordinary chemicals.
- Nylon is used for making socks, ropes, toothbrush, car, seatbelt, bags, curtains etc.

Polyester

- Polyester is composed of repeated ester units hence the name polyester.
- Ester is the chemical compound that gives fruits their sweet smell.
- Polyester is a very popular synthetic fibre. The fabric made from this fibre is quite wrinkle resistant, remains crisp and is easy to wash.
- Terylene is a popular polyester, which can be drawn into very fine fibres that can be woven into a yarn.
- PET is the most familiar form of polyester. It is used for making bottles, utensils, films, wires and many other products.

Acrylic

- This synthetic fibre is lightweight, soft and warm.
- Its resembles to wool makes it’s a substitute of wool in making sweaters, shawls and blankets.
- Natural wool is quite expensive as compared to acrylic. It is available in variety of colours.
- It is strong, durable and resistant to moths and most chemicals.

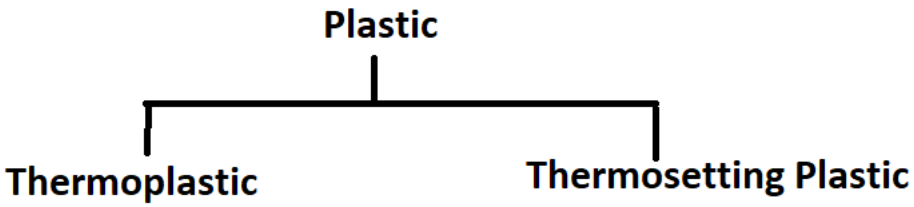
Characteristics of Synthetic fibres

- Synthetic fibres are very strong.
- They have high resistance to wear and tear. Therefore, are more durable.
- They absorb very less water. Hence, they dry quickly.
- Clothes made of synthetic fibres are wrinkle resistant.
- Fabric made of synthetic fibres have very smooth texture.
- They are not attacked by moth.

Plastics

- Plastic is a polymer composed of many repeating units arranged either in a linear fashion or cross- linked pattern.
- This is the reason why name of many plastics begins with ***poly,*** for example, polythene, polystyrene, polyvinyl chloride.
- Plastic is extensively used because it can be recycled, reused, remoulded, coloured, rolled into sheets or wires.
- Plastics are resistant to abrasion and chemicals.
- They have low electrical conductivity, is inexpensive and have low toxicity.

Classification of plastics



Thermoplastic

- Plastics which can be moulded again and again by heating and subsequent cooling are known as Thermoplastics.
- Examples of Thermoplastics are polythene, PVC, Polystyrene etc.
- They are used in manufacturing toys, combs and various types of containers.

Thermosetting Plastic

- Plastics which once moulded cannot be remoulded or softened by heating are known as Thermosetting Plastics. When heated for a long time, they get charred.
- Examples are melamine formaldehyde, urea formaldehyde, epoxy resins, silicone resins etc.
- Bakelite is extensively used for making electrical switches and handles of some utensils because it is poor conductor of heat and electricity.
- Teflon is a polymer that can withstand high temperature and is non- sticky. Therefore, is used for making non- stick coating on cookwares.

Properties of plastics

- Plastics are chemically unreactive and hence are resistant to corrosion.

- Plastic is light weight, strong and durable. Hence finds extensive use in making household articles.
- Plastics are poor conductors of heat and electricity. Hence used for electrical insulation.
- Plastics can be moulded into different shapes, hence used in various industries.
- Plastic is less expensive than any other material. Hence used in numerous applications.

Biodegradable and non- biodegradable material

- The materials that decompose through natural processes, like action by bacteria, is called biodegradable material.
- Generally organic material or material originated from organic sources rot away with time and thus causes no pollution in the environment.
- For example: vegetable and fruits peel, cotton cloth, paper, wood, woollen clothes, jute are biodegradable.
- The materials that is not easily decomposed by natural processes is termed non-biodegradable material.
- Since plastic takes several years to decompose, it is not environment friendly. It causes severe environmental pollution.
- Polymers cannot be decomposed even by burning because it does not burn completely and in turn produces lots of poisonous gases.
- For example, Aluminium, rubber tyres, metals, glass etc.

Harmful effects of plastics

- Plastic is non- biodegradable; thus, it does not decompose and gets collected in the surroundings and pollute the environment.
- The animals eat up the plastic bags thrown here and there. This can choke the respiratory system of the animals such as cow or causes problems in their digestive system.
- Also it clogs the sewer and the drainage system.

4 R's – Reduce, Reuse, Recycle, Recover

- The biodegradable and non-biodegradable wastes should be collected and disposed of separately.
- 4 R in environmental management are Reduce, Reuse, Recycle and Recover.
- Plastic causes major problems in disposal. Therefore, it should be recycled.
- The best way is to reduce or avoid plastic as far as possible.
- As a responsible citizen we should not thrown plastic articles here and there to litter.
- Also, plastic articles should not be thrown in the water bodies.